A primary portion of a characteristic meat flavor is found in its native adipose tissue as was mentioned above. It is therefore no accident that the finest cuts of meats, containing as they do marbling and high adipose concentrations, have the most agreeable and desirable meat flavors as well as the highest saturated fat contents.

Cholesterol is also found primarily in the adipose portions of meat. It is possible, therefore, to reduce both the saturated fat and cholesterol in ground meat products such as hamburger and sausages by simply selecting the leanest cuts and closely trimming these cuts of any freely associated adipose tissue before grinding them. Unfortunately, the resulting hamburger or sausage is reduced in edibility. It tends to lose flavor, to be somewhat crumbly, and to be difficult to both chew and swallow. Also, the absence of adipose tissue in trimmed and ground, lean cuts leads to difficulties during preparation, such as tendencies for the meat to dry out as it cooks, to cook unevenly, and to stick to cooking surfaces.

The drying out of the meat as it cooks can make it unsuitable for commercial applications. In particular, in fast food establishments, it is important to prepare food in advance of high demand periods to prevent customers from waiting overly long for food. Such food preparation services have demonstrated great skill in developing strategies for dealing with this problem. Some have special fast cooking methods and even devices for preparing hamburgers rapidly which seal in juices so that the product does not become dry upon standing for short periods before consumption. And some go so far as to discard any prepared (cooked) hamburger meat if it is held for more than 8 to 12 minutes before purchase by a consumer to guarantee the quality of product which they sell.

Many methods for removing cholesterol from natural food products other than the above-discussed trimming of fat from lean cuts of meat are known.

Such methods usually require that the material which is to be treated to reduce its cholesterol level be either: in liquid form so that enzymes can be brought into adequate contact, or in dry form so that solvents can be applied for cholesterol removal.

Because of the foregoing limitations, no practical method for eliminating cholesterol and/or saturated fats from hamburger and other products containing comminuted meats has yet been discovered. The expedient of simply using lean meat is too great an expense for many institutions and consumers. Also, the consequent losses in flavor, texture, and moistness may make the end product unacceptable.

Those other proposed methods of reducing cholesterol relative to total weight of meat by simply adding moisture cause a loss of product identity since the characteristics of meats with high moisture content —notorious in the case of hams, for example—are significantly different from those to which water has not been added. Also, the shrinkage which results when an "added water" meat is cooked results in an eventual equal concentration of cholesterol on a weight-for-weight basis. Furthermore, the cost of the additional processing makes the "added water" meat more expensive than it would be if lean meat were simply purchased to start with.

SUMMARY OF THE INVENTION

There have now been invented and disclosed herein: (1) certain new and novel comminuted meat products which have reduced contents of cholesterol and saturated fats but do not have the drawbacks of heretofore available products of that character, and (2) methods which can be used to make such products and which avoid such problems as those associated with pumping water into meat, trimming away all visible fat, etc.

A major aspect of this invention is the discovery that the specific fraction of blood referred to as "plasma": (1) possesses cooked flavors exactly like those associated with the meat from which the plasma is derived, and (2) can be emulsified and/or functionally cross-linked with vegetable gums and decholesterolized, low cholesterol, and cholesterol free oils and fats and analogues which may also be free, or have a low degree, of saturation.

It has also been discovered that, by combining: (1) blood plasma binding agents, (2) gellable vegetable gums such as sodium alginate, and (3) unsaturated and/or substantially decholesterolized or cholesterol-free oils or fats or analogues thereof, the plasma can inexpensively be made into products indistinguishable from the natural adipose associated with or normally added to hamburger, sausage, and other ground meats. When artificial adipose produced according to this invention is combined with lean meat to produce hamburger or sausage, that hamburger or sausage will have all functional and organoleptic properties of hamburger or sausage made with natural adipose. It may also have a greatly reduced cholesterol content and, if desired, a similarly reduced saturated fats content. By adjusting the moisture-to-lipid concentration and gelation of the gel and/or its ratio of hydrophilic to hydrophobic ingredients, the artificial adipose can also be made to: (1) impart such other desirable properties such as greater juiciness, juiciness for longer periods after preparation, and reduction of shrink to comminuted meats; and (2) reduce the expense of procurement and preparation of such meats.

The blood protein/vegetable gum (saccharide) fraction of the artificial adiposes disclosed herein can be formulated as gels having unique properties which can be taken advantage of to produce a host of other novel and valuable products.

OBJECTS OF THE INVENTION

It is one important object of the present invention to provide for inclusion in comminuted meats and meat products in place of a substantial portion of the adipose normally found associated with such products an edible, artificial adipose which is lower in cholesterol, may be lower in saturated fats, and is inexpensive and simple to produce.

A related, also important object of the invention resides in the provision of products which contain artificial adipose tissue and which are, functionally and organoleptically, substantially equivalent to conventional comminuted meats.

Another object of the invention is to provide substitute adipose products which keep cooked, comminuted meats juicy for longer periods of time than cooked, natural and comminuted, meat products stay juicy.

An additional object of the invention is to provide a substitute adipose product which, when added to comminuted meat, results in a product containing fewer